Experiment Details

|  |  |
| --- | --- |
| Department Name | Basic Science & Humanities |
| Class | FY B.Tech |
| Semester | 1 st |
| Subject Name | Computer Aided Engineering Drawing Lab |
| Experiment No. | 01 |
| Experiment Name | Use and Practice of basic CAD software commands |

Version History

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Sr. No. | Version Number | Created By | Approved By | Date |
| 1 | v1.1 | Priti Bhokare | MRS. Pooja Patil | 06/10/2020 |
|  |  |  |  |  |

AIM:

To study and practice basic draw commands exist in the Auto CAD.

THEORY:

**Commands: -**

• Line

• Poly line

• Construction line

• Polygon

• Rectangle

• Arc

• Circle

• Ellipse

**Line:** The LINE command is used to draw a line between two specified points. First enter the LINE command or shortcut L in the command area. Mouse Cross hair displays to specify the first point of the line and next point of the line or enter the distance of the line. Press ESC key at the end of the line.

**Polyline:** POLYLINE command is used to draw a series of lines continuously at a time. PL or PLINE is the keyboard shortcut for polyline.

**Rectangle:** RECTANGLE command is used to draw a rectangular geometry in the drawings. REC is the keyboard shortcut for rectangle. First enter the REC command in the command area. A cross hair will be displays to specify the first corner point of the rectangle and input the dimensions of the rectangle as other corner point.

**Circle:** Circles are created with the CIRCLE command. There are several different ways you can define a circle. Those are defining center point and radius or diameter of the circle. In the 2Point method Define the circle with points on either end of the circle diameter. In the 3Point method Define the circle with 3 noncollinear points. In the Tangent, Tangent and Radius method define the circle by specifying two other objects that are tangent to the circle and the radius of the circle.

**Arc:** ARC command is used draw partial circles in the Auto CAD drawings. There are seven methods available to draw an arc in the Auto CAD. Those are

1. Specifying 3 points on the arc
2. Specifying starting point, center and end point
3. Specifying starting point, center and included angle
4. Specifying starting point, center and length of the cord
5. Specifying starting point, end point and radius
6. Specifying starting point, end point and included angle and
7. Specifying starting point, end point and direction of start

**Polygon:** The POLYGONE command is used to draw a polygon with 3 to 1024 sides by specifying a circle inscribed or circumscribed with definite radius or by entering side length of the polygon.

**Ellipse:** This ELLIPSE command is used to draw ellipses by giving starting and ending angles.

**Rotate Command:** Rotate command facilitates to rotate the object at defined angle. This command is used to rotate object about a base point max by 360 where as move command facilitates to move the object anywhere in the drawing

PRE TEST:

1.How many snap points does a circle have?

* 3
* 5
* 4
* 6

Ans: 5

2.The basic attributes of a straight line segment are

* Type
* Width
* Color
* All of these

Ans: All of these

3.If I want to draw a line in the direction 07:30 will give an angle ……..?

* -225 degrees
* 270 degress
* -135 degress
* None of these

Ans: -135 degrees

4.When drawing in 2D , what axis do you NOT work with?

* X
* Y
* Z
* WCS

Ans: z

5.In AutoCAD , all objects are drawn on the

* YZ plane
* XZ plane
* XY plane
* ZX plane

Ans: XY plane

PROCEDURE:

**Line:** To draw a line, line command is used. Line command can be given by following ways.

1. Click on line icon.

2. Type by key board, „line‟ in command window.

3. By selecting line option icon „DRAW‟ menu. Having given line command, supply co – ordinates of start point and endpoint. Starting point & end point can be clicked also.

Command:

line ←┘ (enter)

From Pt – 1: (50, 50) ←┘ (enter)◄┘

To Pt – 2:(200, 50) ←┘(enter)

Line will be ready on screen.

**Rectangle Command:** Rectangle is a quadrilateral having two pairs of opposite sides equal and 4 angles are each of rectangle command can be given in 3 different ways as under.

1. Click by mouse on “Rectangle” tool bar icon.
2. Type by keyboard word “Rectangle” in command.
3. Select “Rectangle” option from draw menu

Command: Rectangle

Specify first corner point: 40, 30 ◄┘ (enter)

(or) [Chamfer/elevation/ fillet/thickness/width]

Specify other corner point: 170, 110 ◄┘ (enter)

(or) (Dimensions)

**Circle command:**

1. Center radius method:

Command: Circle

3p/2p/ПR/ : 100,100 ( locate point with mouse/ type by key board)

Diameter/ < Radius >: 50 (given radius by mouse/ type radius by kb as 50)

Circle will be drawn having center point (100, 100)

1. Center, diameter method:

Command: circle

3p/2p/ПR/ : 100,100

Diameter: D 100(First enter D & then type diameter 100.

Circle will drawn having diameter 100 & cp 100

**Arc Command:**

Arc command is used to draw arc of a circle. Arc command can be given in 3 different ways as under.

1. Click by mouse (or) “Arc” tool bar as under.
2. (ii) Type by key board word “Arc” in command window.
3. (iii) Select “Arc” option from draw menu.

Command : Arc ◄┘ (enter)

First start pt – 1 of arc (or) (center) :120, 70 ◄┘ (enter) 15 2nd pt –

2 of arc (or) (centre/end) :70, 120 ◄┘ (enter)

3 rd end pt – 3 of arc : 40, 30 ◄┘ (enter)

**Ellipse Command:**

To draw ellipse, ellipse command is used. This command can be operated in 3 different methods as under.

1. Click on “ellipse” tool bar icon
2. (Type “ellipse” by K.B in command window
3. By selecting Ellipse option from draw menu

Ex:

Command : Ellipse ◄┘ (enter)

1. Specify axis end point of ellipse : (45, 90) ◄┘ (enter)
2. Specify other end point of axis : (195,90) ◄┘ (enter)
3. Specify distance to other axis : 120, B5 ◄┘ (enter)

(Or) (Rotation)

Ellipse will be drawn having

1. Major axis length = (195 – 45) = 150
2. minor axis length = 2(135 – 90) = 90 One can select the point by clicking the mouse at axis end point , centre etc. instead of giving co – ordinates.

**Polygon Command:**

Polygon command is used to draw regular polygon shapes. Although one can draw polygon also with line command but it takes more time polygon command draws polygon faster with high accuracy.3 sides i.e., triangle, to 1024 sides regular polygons can be draw with polygon command. Polygon command can be given in 3 different methods as under.

1. Click on “polygon” tool bar
2. Type polygon by key board in command window
3. Select polygon option from „draw‟ menu There are 3 methods of drawing polygons.

command :

polygon ◄┘ (enter) Number of sides : 6 ◄┘

(enter) Centre of polygon : (100, 100) ◄┘

(enter) Inscribed in circle/circumscribed About circle (I / C) : I ◄┘

(enter) Radius of circle : 50 ◄┘

(enter)

**Rotate Command:**

Rotate command can be give in 3 different ways as under.

1. Click on mouse by „Rotate‟ tool bar icon
2. Type by keyboard word “Rotate” in command window.
3. By selecting „Rotate‟ option from modify menu.

After giving rotate command, computer will prompt

1. Select the object
2. Specifying the base point of rotation &
3. Specifying rotation angle.

Ex: Command : ROTATE.

Select objects : Select rectangle by clicking on it by mouse ◄┘ (enter)

Specify Base pt: Click on pt c by mouse. Rotation angle: 450 ◄┘ (enter)

NOTE: Rotation angle should be mentioned only in counter clock wise direction

POST TEST:

1.Which of the following file extensions cannot open the AutoCAD?

* dwg
* dxf
* dot
* dws

Ans: dot

2.To print the entire project ,you will choose to regulate what to plot

* Display
* Extends
* Limits
* Window

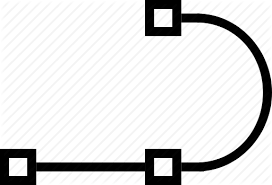
Ans: Limits

3.What you cannot create from the command offset

* Vertical straight
* Concentric circle
* Three parallel lines
* Parallel arcs

Ans: Vertical straight

4.What does this AutoCAD icon represent ?



* Arc
* Spline
* Polyline
* Line

Ans: Polyline

5.An “arc” can be drawn by

* Start , end ,direction
* Start , end , radius
* Start , center , end
* 3 points
* All of these

Ans: All of these

REFERENCES:

Engineering Graphics with AutoCAD by **D.M. Kulkarni**